

5 CLAIMS**WHAT IS CLAIMED IS:**

1. An isolated nucleic acid molecule comprising a polynucleotide having a nucleotide sequence at least 96.7% identical to a sequence selected from the group consisting of:
 - 10 (a) a polynucleotide fragment of SEQ ID NO:3 or a polynucleotide fragment of the cDNA sequence included in ATCC Deposit No: PTA-2966, which is hybridizable to SEQ ID NO:3;
 - (b) a polynucleotide encoding a polypeptide fragment of SEQ ID NO:4 or a polypeptide fragment encoded by the cDNA sequence included in ATCC Deposit No: 15 PTA-2966, which is hybridizable to SEQ ID NO:3;
 - (c) a polynucleotide encoding a polypeptide domain of SEQ ID NO:4 or a polypeptide domain encoded by the cDNA sequence included in ATCC Deposit No: PTA-2966, which is hybridizable to SEQ ID NO:3;
 - (d) a polynucleotide encoding a polypeptide epitope of SEQ ID NO:4 or a 20 polypeptide epitope encoded by the cDNA sequence included in ATCC Deposit No: PTA-2966, which is hybridizable to SEQ ID NO:3;
 - (e) a polynucleotide encoding a polypeptide of SEQ ID NO:4 or the cDNA sequence included in ATCC Deposit No: PTA-2966, which is hybridizable to SEQ ID NO:3, having glycine receptor activity;
 - 25 (f) a polynucleotide which is a variant of SEQ ID NO:3;
 - (g) a polynucleotide which is an allelic variant of SEQ ID NO:3;
 - (h) an isolated polynucleotide comprising nucleotides 4 to 1293 of SEQ ID NO:3, wherein said nucleotides encode a polypeptide corresponding to amino acids 2 to 431 of SEQ ID NO:4 minus the start codon;
 - 30 (i) an isolated polynucleotide comprising nucleotides 1 to 1293 of SEQ ID NO:3, wherein said nucleotides encode a polypeptide corresponding to amino acids 1 to 431 of SEQ ID NO:4 including the start codon;
 - (j) a polynucleotide which represents the complimentary sequence (antisense) of SEQ ID NO:3; and
 - 35 (k) a polynucleotide capable of hybridizing under stringent conditions to any one of the polynucleotides specified in (a)-(j), wherein said polynucleotide

5 does not hybridize under stringent conditions to a nucleic acid molecule
 having a nucleotide sequence of only A residues or of only T residues.

2. The isolated nucleic acid molecule of claim 1, wherein the
polynucleotide fragment comprises a nucleotide sequence encoding a human glycine
receptor protein.

10 3. A recombinant vector comprising the isolated nucleic acid molecule of
claim 1.

4. A recombinant host cell comprising the vector sequences of claim 3.

5. An isolated polypeptide comprising an amino acid sequence at least
96.2% identical to a sequence selected from the group consisting of:

15 (a) a polypeptide fragment of SEQ ID NO:4 or the encoded sequence included
in ATCC Deposit No: PTA-2966;

 (b) a polypeptide fragment of SEQ ID NO:4 or the encoded sequence included
in ATCC Deposit No: PTA-2966, having glycine receptor activity;

20 (c) a polypeptide domain of SEQ ID NO:4 or the encoded sequence included
in ATCC Deposit No: PTA-2966;

 (d) a polypeptide epitope of SEQ ID NO:4 or the encoded sequence included
in ATCC Deposit No: PTA-2966;

 (e) a full length protein of SEQ ID NO:4 or the encoded sequence included in
ATCC Deposit No: PTA-2966;

25 (f) a variant of SEQ ID NO:4;

 (g) an allelic variant of SEQ ID NO:4;

 (h) a species homologue of SEQ ID NO:4;

 (i) a polypeptide comprising amino acids 2 to 431 of SEQ ID NO:4, wherein
said amino acids 2 to 431 comprise a polypeptide of SEQ ID NO:4 minus the start
methionine;

30 (j) a polypeptide comprising amino acids 1 to 431 of SEQ ID NO:4;

 (k) a polypeptide encoded by the cDNA contained in ATCC Deposit No.

 PTA-2966; and

 (l) a polypeptide comprising the polypeptide sequence of SEQ ID NO:74;

- 5 6. The isolated polypeptide of claim 5, wherein the full length protein comprises sequential amino acid deletions from either the C-terminus or the N-terminus.
7. An isolated antibody that binds specifically to the isolated polypeptide of claim 5.
- 10 8. A recombinant host cell that expresses the isolated polypeptide of claim 5.
9. A method of making an isolated polypeptide comprising:
 (a) culturing the recombinant host cell of claim 8 under conditions such that said polypeptide is expressed; and
15 (b) recovering said polypeptide.
10. The polypeptide produced by claim 9.
11. A method for preventing, treating, or ameliorating a medical condition, comprising the step of administering to a mammalian subject a therapeutically effective amount of the polypeptide of claim 5 or the polynucleotide of claim 1.
- 20 12. A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject comprising:
 (a) determining the presence or absence of a mutation in the polynucleotide of claim 1; and
 (b) diagnosing a pathological condition or a susceptibility to a pathological
25 condition based on the presence or absence of said mutation.
13. A method of diagnosing a pathological condition or a susceptibility to a pathological condition in a subject comprising:
 (a) determining the presence or amount of expression of the polypeptide of claim 5 in a biological sample; and
 (b) diagnosing a pathological condition or a susceptibility to a pathological
30 condition based on the presence or amount of expression of the polypeptide.
14. An isolated nucleic acid molecule consisting of a polynucleotide having a nucleotide sequence selected from the group consisting of:
35 (a) a polynucleotide encoding a polypeptide of SEQ ID NO:2;

- 5 (b) an isolated polynucleotide consisting of nucleotides 4 to 1251 of SEQ ID NO:1, wherein said nucleotides encode a polypeptide corresponding to amino acids 2 to 417 of SEQ ID NO:2 minus the start codon;

10 (c) an isolated polynucleotide consisting of nucleotides 1 to 1251 of SEQ ID NO:1, wherein said nucleotides encode a polypeptide corresponding to amino acids 1 to 417 of SEQ ID NO:2 including the start codon;

15 (d) a polynucleotide which represents the complimentary sequence (antisense) of SEQ ID NO:2;

(e) a polynucleotide encoding a polypeptide of SEQ ID NO:4;

(f) an isolated polynucleotide consisting of nucleotides 4 to 1293 of SEQ ID NO:3, wherein said nucleotides encode a polypeptide corresponding to amino acids 2 to 431 of SEQ ID NO:4 minus the start codon;

20 (g) an isolated polynucleotide consisting of nucleotides 1 to 1293 of SEQ ID NO:3, wherein said nucleotides encode a polypeptide corresponding to amino acids 1 to 431 of SEQ ID NO:2 including the start codon;

25 (h) a polynucleotide encoding the HGRAsv polypeptide encoded by the cDNA clone contained in ATCC Deposit No. PTA-2966; and

(i) a polynucleotide which represents the complimentary sequence (antisense) of SEQ ID NO:4.

15. The isolated nucleic acid molecule of claim 14, wherein the polynucleotide comprises a nucleotide sequence encoding a human glycine receptor protein.

20. A recombinant vector comprising the isolated nucleic acid molecule of claim 14.

25. A recombinant host cell comprising the recombinant vector of claim 16.

30. An isolated polypeptide consisting of an amino acid sequence selected from the group consisting of:

(a) a polypeptide fragment of SEQ ID NO:2 having glycine receptor activity;

35. (b) a polypeptide domain of SEQ ID NO:2 having glycine receptor activity;

- 5 (c) a full length protein of SEQ ID NO:2;
- (d) a polypeptide corresponding to amino acids 2 to 417 of SEQ ID NO:2,
wherein said amino acids 2 to 417 comprise a polypeptide of SEQ ID
NO:2 minus the start methionine;
- 10 (e) a polypeptide corresponding to amino acids 1 to 417 of SEQ ID NO:2;
- (f) a polypeptide fragment of SEQ ID NO:4 having glycine receptor
activity;
- (g) a polypeptide domain of SEQ ID NO:4 having glycine receptor
activity;
- (h) a full length protein of SEQ ID NO:4;
- 15 (i) a polypeptide corresponding to amino acids 2 to 431 of SEQ ID NO:4,
wherein said amino acids 2 to 431 comprise a polypeptide of SEQ ID
NO:4 minus the start methionine;
- (j) a polypeptide corresponding to amino acids 1 to 431 of SEQ ID NO:4;
and
- 20 (k) a polypeptide encoded by the cDNA contained in ATCC Deposit No.
PTA-2966.
19. The method for preventing, treating, or ameliorating a medical
condition of claim 11, wherein the medical condition is a disorder
selected from the group consisting of: neural disorder, a neural
disorder related to aberrant excitotoxic cell death, a neural disorder
related to chronic peripheral neuropathies, a gastrointestinal disorder, a
gastrointestinal disorder related to aberrant longitudinal
muscle/myenteric plexus contractions, irritable bowel syndrome, a
disorder related to hyper glycine receptor activity.